Battle Tinker - Conclusion Chapter

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Contents

1 Changes and Improvements since Alpha Release

1.1 Game play

Our game is now on a stable and good playable version. We have improved a lot since the Alpha Release. First of all we fixed all bugs we have seen during the play testing sessions. In the Editor, we have changed the following things:
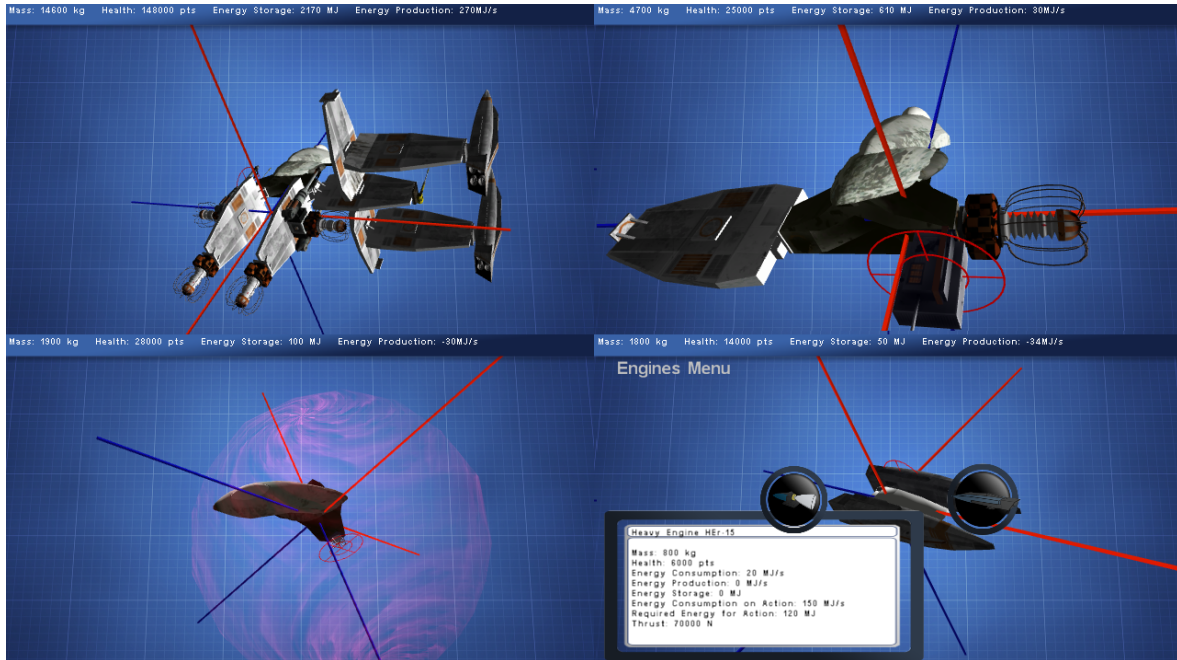
Figure 1: Four Player Editing Ships

- We added 5 predefined spaceships

- The structures are now highlighted in three different colors, to indicate on which structure the navigator is located at the moment (yellow), to which the navigator is pointing to (blue) and which structure is the yellow structures parent (red).

- It is now possible to rotate structures in both directions.

- We have made the camera movement slower.

- A bar on the top displays important information about the ship: Total Mass, Total Health, Total Energy Storage and Total Energy Production.

- An info box appears in the menu and displays all attributes to a selected structure: Mass, Health, Energy Consumption, Energy Production, Energy Storage, Energy Consumption on Action, Required Energy for Action, Thrust and Damage.

The Arena was changed as follows:

- We added a speed indicator.
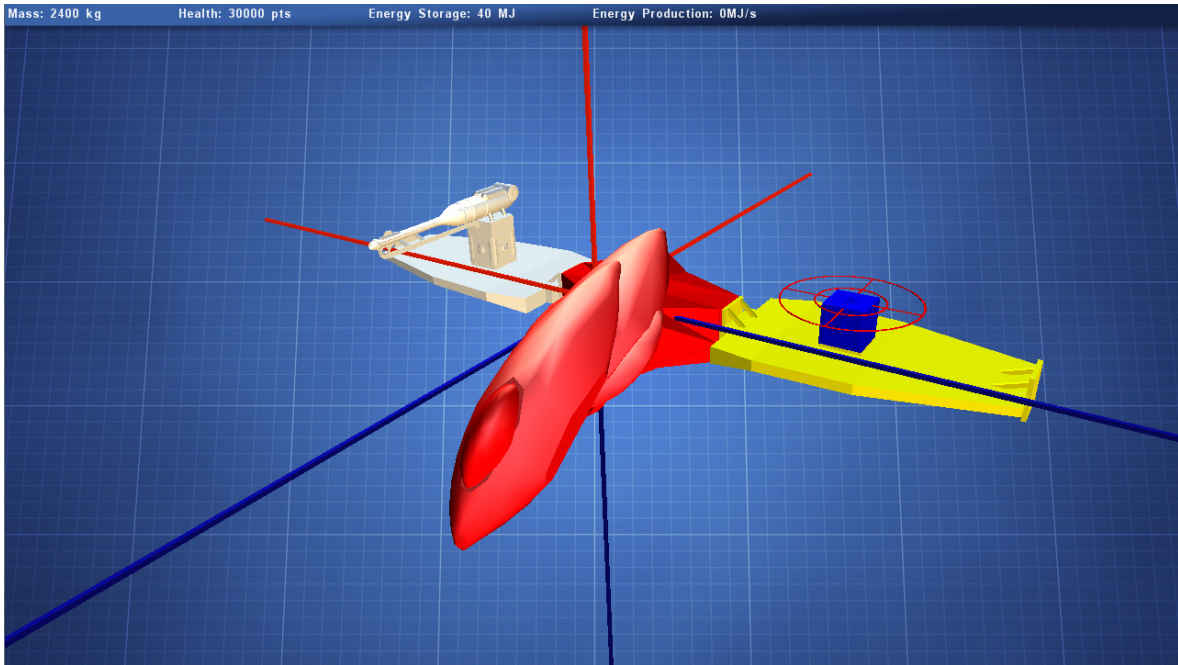
Figure 2: Colors helping the player to navigate on the ship. Press the yellow button to cycle through the junctures on the yellow structure. Press the red button to change to the red structure (parent). Press the blue button to change to the blue structure (child).

- The Energy Supply produces less energy (to prevent a loop hole).

- The Heavy Laser Turret shoots now slower and deals less damage.

- The spawning points are randomized (to prevent spawn camping).

- We added an Invisibility Device

- We added bounds to the Arena. When a ship leaves the Arena bounds it suffers damage.

- The other players and the space station are indicated on the HUD.

To the menu screens we added the skybox component with a slowly, randomly moving camera which gives a very nice, dynamic effect.

Figure 3: Spacecraft with shield

1.2   Graphics

In addition to that, we started to improve the graphics a lot, because we really wanted the game to look nice. We added some more textures and effects.

- Screen ratio was changed to 16:9 and resolution is now 720p

- All models are textured.

- The default shader from XNA is now replaced by a more improved one. It is able to display up to twelve point lights and a direction light using phong shading.

- There is now a very nice effect for the shield structure.

- The particle explosions have been replaced by much nicer looking animated explosions. This is provided by a special pixel shader effect that blends the predesigned explosion textures.

- The content is now loaded in a separate thread, such that the background story can be displayed during loading.

1.3   Sound

To ensure professionalism, we also needed to add a couple of sound effects. We provide the following high quality stereo sounds that are either self created or mixed out of sound libraries:

- five ship explosion sounds

Figure 4: New Animated Menu

- two structure explosion sounds

- three laser fire sounds for each laser turret type

- three alarm and voice warning sounds to be used in the cockpit

- four sounds for menu buttons

- five sounds for adding a new structure

- three sounds for removing a structure

- one sound for each engine type

- one sound for the invisibility device

- four laser hit sounds

- two metal bounce sounds to be used when ships collide.

Furthermore, we finally composed the Battle Tinker Main Theme. We were inspired by music from similar (war)-games and films and tried to create an epic, threatening and heavy on percussion theme. We used Cubase SX3 with East West Symphonic Orchestra to create the song. Contradictory to the Game Proposal Chapter, we decided not to play any music in the Arena and in the Editor. The Arena is full of sound anyway and music would distract from game play. Also, music in the Editor would distract other players that are playing in the Arena at the same time.

Figure 5: Four Player Battle

1.4 Performance

In the last week, we recognized that we did so much improvement in graphics that the game did not perform well on the Xbox anymore. During the last days we tried to optimize the performance as follows:

- We added Frustum Culling in addition to the Back Face Culling supported by the Xbox framework.

- We use low detailed models if the structure is displayed far away from the camera (Level Of Detail).

- If the ship is really far away, we even do not display the small structures anymore.

- We made the textures smaller.

- We do not play all ship sounds for each player anymore but only for the player that belongs to the ship.

- We minimized the flops in the collision detection by not updating the positions of the collision objects if not necessary.

With all this improvement, it is now possible to play the game by up to four players on the Xbox.
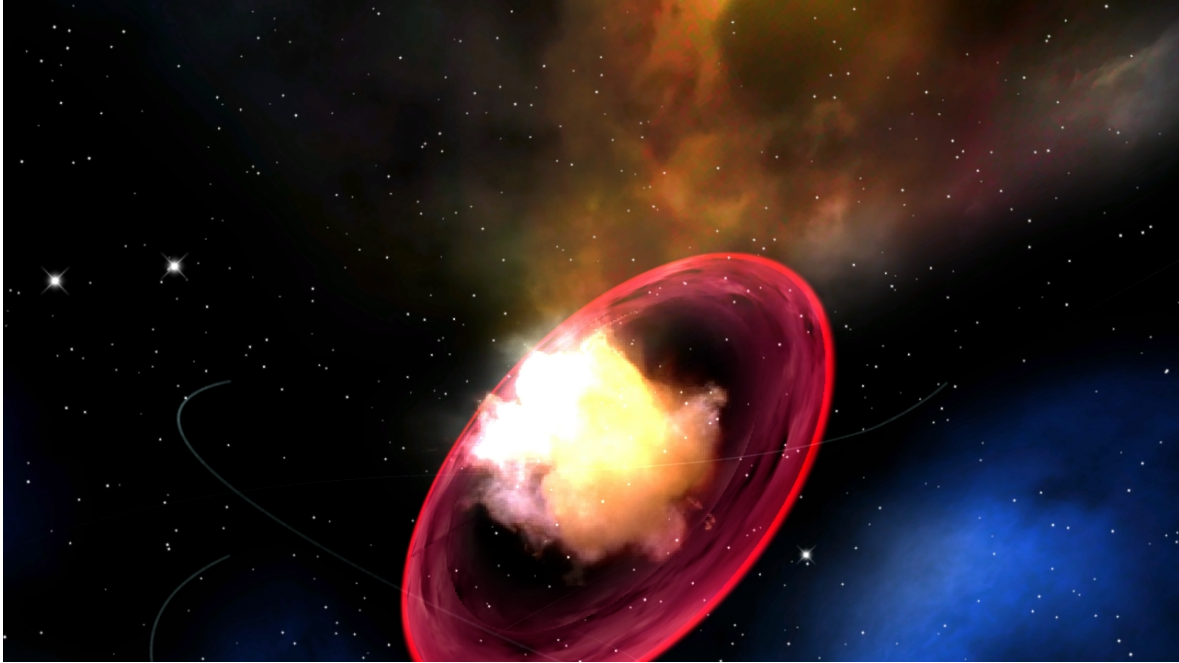
Figure 6: New animated explosion with blast ring

2 Experience

Game design is as interesting and as fun as we expected. The final game matches quite well our initial design idea. We just skipped little parts of the initial design like the rockets. On the other hand, we added some additional things like the space station, advanced graphic effects, the invisibility device and two different engines, weapons and cockpits (instead of one each).

We were able to follow the development schedule more or less. We slightly fell behind for the prototype chapter and the interim report due to the physics engine which took more work than expected. But we caught up before the Alpha Release. In the end we have even reached our high target.

While carrying out a development schedule, we were aware of what lied ahead and which milestones we had to achieve yet. This helped us to divide the work in to chunks of work and to assign them to the team members. Thanks to the schedule, we were also aware of how much we had done and if we had fallen behind the expected goals. The interim report was a good instrument of enforcing the team to finish a preliminary version of the game. Without these reports, the game might have never been playable.

Unfortunately, the play testing was very late in the semester hence we didn't have time to retest the changes we made based on the play testing results. We would suggest making a first play testing session for friends early on right after the interim report.

As we heard from NVIDIA, this is like in the industry. We like the fact that there is at least one course at ETH that is closely related to the industry and less to the academic world.
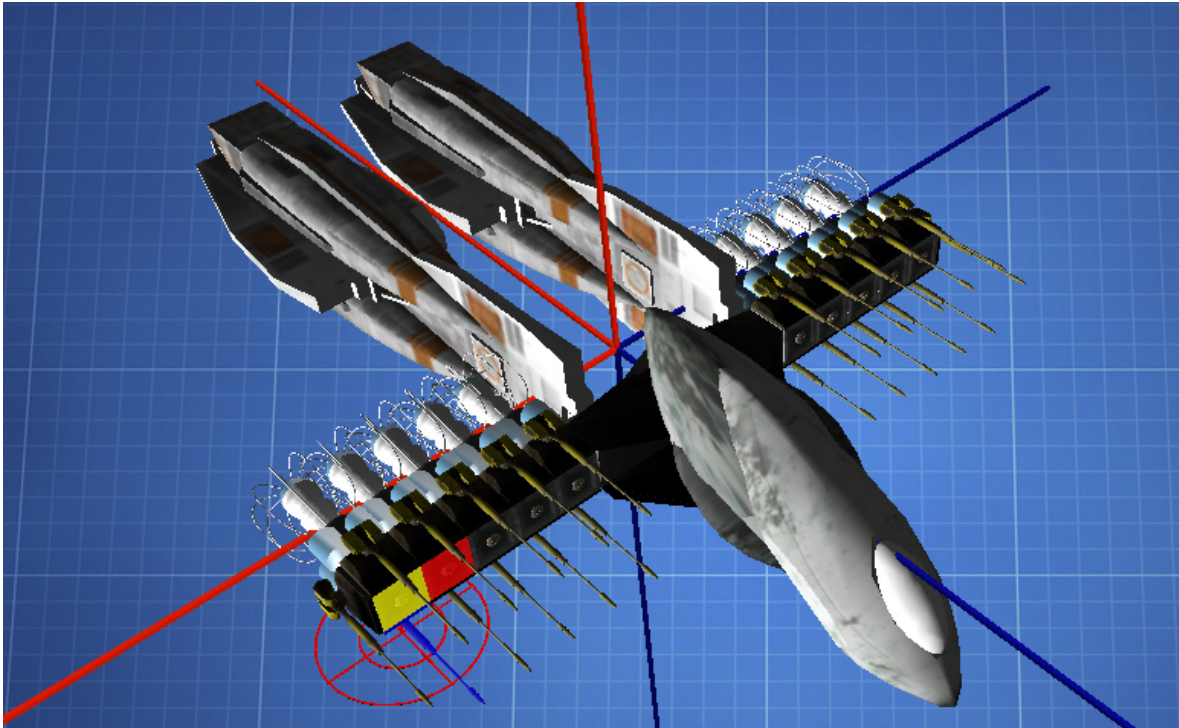
Figure 7: Heavy Armed Ship

3 Conclusion

The course was really exciting and it fully met our expectations. But there are still some possible improvements to be concerned. The XNA-Framework could be even better documented. We lost the first two weeks acquiring the necessary knowledge to begin with XNA. The schedule was really compressed, although the amount of work was not unexpected.

All in all, we liked the course very much, and we are really proud of our game.

3.1 Answers to the Debriefing Questions

3.1.1 What was the biggest technical difficulty during the project?

- Rigid Body Simulation (3D Math).

- Building of convex hulls.

- Declaration model of the structures.

3.1.2 What would you do differently in your next game project?

- Assign the content creation to only one person (to preserve a consistent design).

- More play testing sessions for a continuous improvement of the game.

- Achieve earlier a playable solution to begin with play testing early on.

3.1.3 What was your greatest success during the project?

- Being able to make a steerable, playable ship.

3.1.4 Are you happy with the final result of your project?

- We are very proud of our game and its fun to play!

3.1.5 Do you consider the project a success?

- Yes, but we would like to have more time to implement more structures.

3.1.6 To what extend did you meet your project plan and milestones?

- All goals are implemented except missiles and the redo/undo functionality in the Editor.

3.1.7 What improvements would you suggest for the course organization?)?

- We'd like more tutorial and less theory lessons and a better synchronization between the status of our project and the presentation topics.

- Introduce a second play testing sessions.

3.1.8 Did you like the XNA framework?

- Xna is a very fast, intuitive and easy way to make really good looking games. But there are some flaws though:

- XML deserialization doesn't really work on the Xbox.

- Sound engineering in XACT is badly documented.

- The float-type does not seem to be really optimized on the Xbox although it is used in all math libraries.

A   Battle Tinker Quick User Guide

Welcome to Battle Tinker! Build your own space ship and compete against your friends! You can either choose to fly a predefined ship or create a new one. Predefined ships are:

The Bee A small and agile ship

The Fast Fighter A fast ship without guns

The H-Tank A medium size H-shaped fighter ship with a shield

The X-Tank A medium size X-shaped fighter ship with a shield

The Bomber A large, heavy armored ship

In the Editor you can modify any ship and save and load it to and from your hard drive. In the Battle Arena you can test your ship. You win the round, if you get five kills. Be careful though, if you crash into the space station or commit suicide your kills decrease! You can choose from three different Arena difficulties:

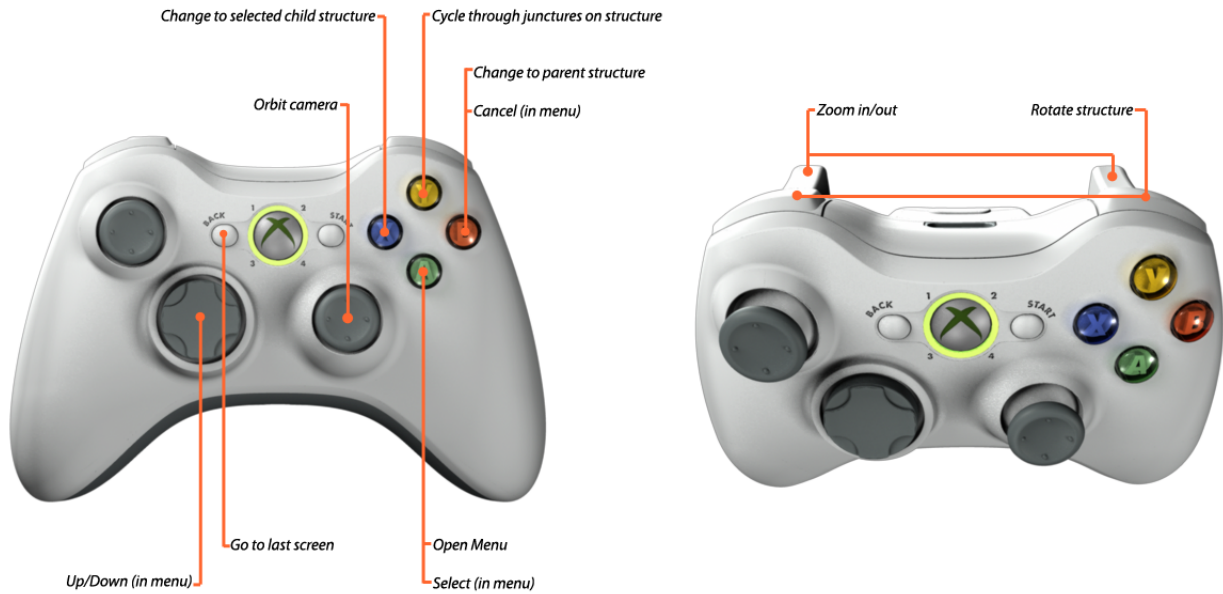**Real Space** Fly as in real space without any friction.

Medium Space Your ship experiences some friction and will sooner or later stand still.

Easy Space Your ship experiences much friction and will soon stand still.

Tips for building a ship

- Try to create a symmetrical ship that has its center of mass in the middle as it will be much easier to fly.

- Make sure you have enough energy! A ship with higher energy consumption than energy generation will not fly at all.

- Place a laser turret where its backstroke will not affect the balance of the ship too much.

- Always place some extra cube structures so your ship will remain easy upgradable.

- Think about the button assignment. An unfortunate assignment of buttons to engines makes a ship almost impossible to fly.

A.1 Controller Configuration Editor

Change to selected child structure
Cycle through junctures on structure
Change to parent structure
Orbit camera
Cancel (in menu)
Zoom in/out
Rotate structure
Go to last screen
Open Menu
Up/Down (in menu)
Select (in menu)

A.2 Controller Configuration Battle Arena

Change camera (press)
Exit battle
Can be assigned to structures in Editor
Commit suicide

A.3   Battle Arena Ship HUD

Other players indicator

Cockpit Health

Ship Health

Velocity

Available energy

Player Statistics

STATS:
Kills: -1
Deaths: 1

HEALTH

Overall Ship Health: 210000
Cockpit Health: 8000

Velocity: 31 km/h

ENERGY

Energy Storage: 2220 MJ
Energy Consumption: -230 MJ/s
Available Energy: 1139 MJ

Ship Attributes

Space Station indicator